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AF-27

State of Michigan

Michigan State Plan for Alternative Fueled Vehicles

December 1996

Prepared by: Alternative Fueled Vehicle
Inter-Departmental Task Force

Department of Agriculture
Department of Consumer and Industry Services
Department of Environmental Quality
Department of Management & Budget
Department of State
Department of State Police
Department of Transportation
Department of Treasury

STATE OF MICHIGAN

OFFICE OF THE GOVERNOR

LANSING

JOHN ENGLER
GOVERNOR

December 19, 1996

Mr. John Sarver, Chair
Alternative Fueled Vehicle
Inter-Departmental Task Force
Energy Resources Division
Department of Consumer & Industry Services
PO Box 30221
Lansing, Michigan 48909

Dear Mr. Sarver:

I commend the Alternative Fueled Vehicle Inter-Departmental Task Force for their fine work in preparing this report. Alternative fuels have the potential to provide energy security, economic development, and environmental benefits for Michigan.

The Department of Management and Budget's (DBM) Motor Transport Division has taken the initiative to investigate and try various types of alternative fueled vehicles (AFV's) so that Michigan can meet the federal purchasing mandates in the most efficient manner. I commend the Motor Transport Division's leadership in this area and encourage DMB to continue its prudent purchasing of AFV's and its efforts to help develop a retail fueling infrastructure to support these vehicles.

The Energy Resources Division, Department of Consumer and Industry Services, should continue its efforts to promote Clean Cities and community-wide planning to develop AFV infrastructure. Public education efforts should be pursued so that consumers and fleet managers can make informed decisions about AFV's. The Departments of Agriculture and Transportation can play a role in public education by helping drivers locate fueling sites that have alternative fuels.

I have requested that the Task Force continue monitoring the development of the alternative fuels industry to assure that State government does not inadvertently create regulatory or other barriers that inhibit the market development of this industry. The Findings and Recommendations in the report can be helpful in guiding State department actions related to alternative fuels.

Sincerely,

John Engler
Governor

JE/rlf/pw

RECYCLED PAPER

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I. Introduction

A. Overview of the State Plan

Section 409 of the U.S. Energy Policy Act (EPAct) of 1992 established a state and local incentive program and planning process to promote the use of alternative fueled vehicles (AFV's). A proposed state plan must include an examination of a variety of state and local incentives with respect to alternative fueled vehicles, alternative fuels, and alternative fuel refueling facilities.

In response to EPAct, Governor John Engler established an inter-departmental task force to analyze issues related to the development of alternative fueled vehicles in Michigan. Task force members from appropriate state agencies prepared background information on AFV's and analyzed various AFV issues. The Task Force tried to identify any barriers to the introduction of AFV's into the marketplace. A draft plan was released for public comment in July 1996 and comments were submitted to the Task Force by August 30, 1996. Many comments were received on the fuel neutrality policy, the potential benefits from AFV's, whether there should or should not be government incentives to promote AFV's, the Task Force recommendations, and the Minority Report. The comments from the 18 interested parties were very helpful in the preparation of this final plan. The comments from interested parties can be found in Appendix C.

This report begins by providing background information on existing AFV requirements and incentives, and the present status of AFV's in Michigan. This report then analyzes the potential benefits of AFV's and a variety of issues identified in EPAct related to the development of AFV's in Michigan. This report concludes with findings and policy and program recommendations.

B. Definition of Alternative Fueled Vehicles

The U.S. Energy Policy Act of 1992 defines alternative fuel to mean "methanol, denatured ethanol, and other alcohols; mixtures containing 85% or more (or such other percentage, but not less than 70%, as determined by the Secretary of Energy, by rule, to provide for cold start, safety, or vehicle functions) by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels; natural gas; liquefied petroleum gas; hydrogen; coal-derived liquid fuels; fuels (other than alcohol) derived from biological materials; and electricity (including electricity from solar energy)."

Biodiesel is an alternative fuel for diesel engines that is derived from renewable biological feedstocks. Most biodiesel fuel in use today is derived from processed and refined soybean oil and may also be referred to as "soydiesel." Neat biodiesel fuel (100% biodiesel) has been recognized and approved by the U.S. Department of Energy in October 1995 as an alternative fuel pursuant to EPAct. The biodiesel industry has also requested that a 20% biodiesel fuel blend be recognized as an alternative fuel by DOE and this request is currently pending.

An alternative fueled vehicle is any type of motor vehicle that uses an alternative fuel. However, there are different types of AFV's. A "bi-fuel" or "dual-fuel" vehicle has two separate fuel systems designed to run on either an alternative fuel or conventional gasoline, using only one fuel at a time. These vehicles are advantageous for drivers who do not always have access to alternative fuel refueling stations, but sacrifice the potential for optimized combustion and very low evaporative emissions. A "flexible-fuel" vehicle is designed to run on blends of unleaded gasoline with either ethanol or methanol. A "dedicated" vehicle is designed to exclusively use an alternative fuel.

II. AFV Requirements and Incentives

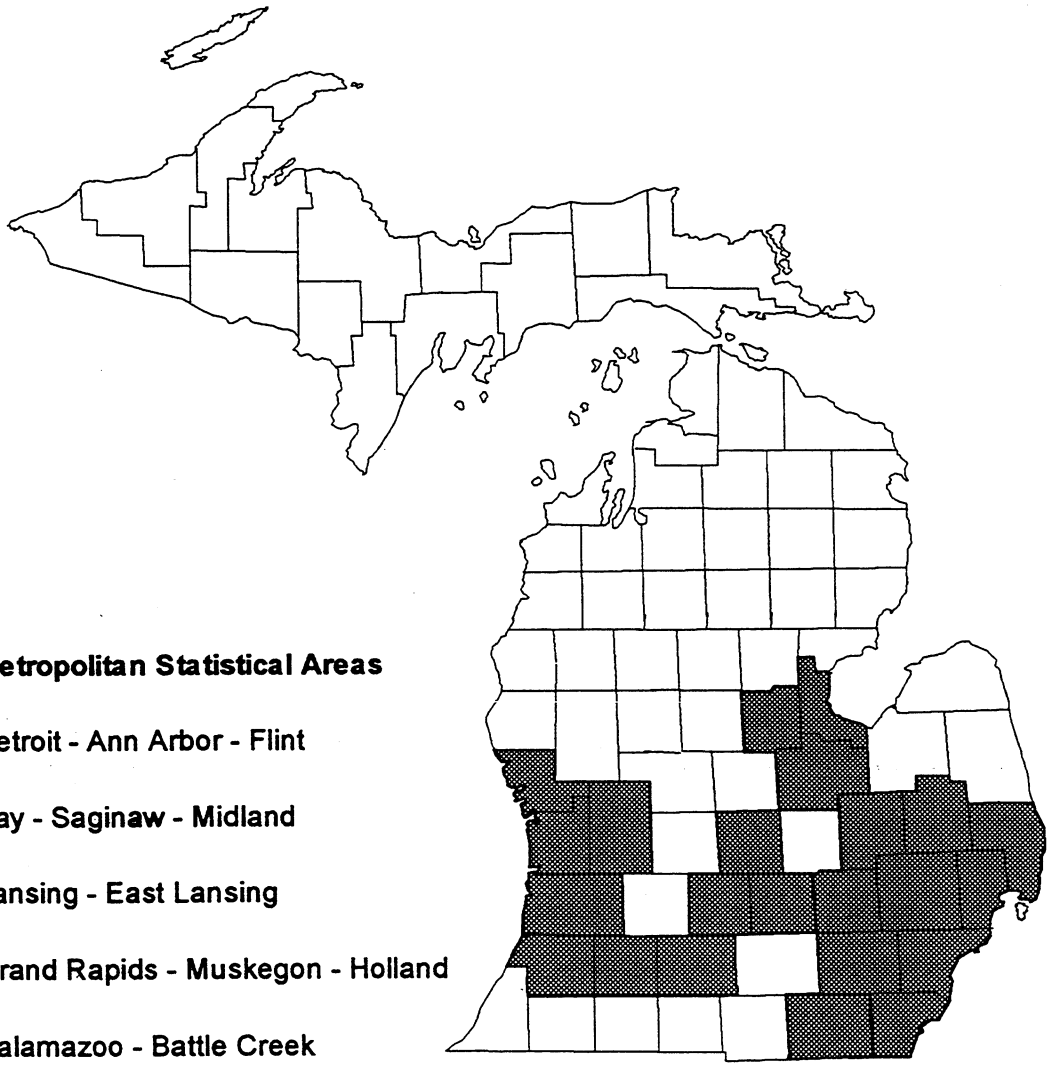
A. U.S. Energy Policy Act of 1992 Requirements for Vehicle Fleets

The Energy Policy Act (EPAct) of 1992 mandates purchases of alternative fueled vehicles for certain public and private vehicle fleets. EPAct applies to fleets in consolidated metropolitan statistical areas with populations of 250,000 or more. The map on the next page identifies the 23 Michigan counties included in this requirement. EPAct applies to fleets with a minimum size of 20 vehicles locally and 50 vehicles nationally that are or could be centrally fueled. Vehicles less than 8,500 lb. GVW are covered. Several groups of vehicles are excluded including law enforcement, emergency vehicles, certain military vehicles, and non-road vehicles. EPAct applies to new vehicle purchases starting in 1996. The chart below summarizes the EPAct requirements.

Municipal and private fleet programs must be determined by DOE to be necessary before they become requirements. Under EPAct, the DOE Secretary has two opportunities to rule on AFV purchases for private fleets. If a rulemaking is issued by December 15, 1996, then the percentages in the "early rule" column apply. If a rulemaking is not issued until later (January 1, 2000 deadline),

Year	Federal Government Fleets	State Government Fleets	Utility & Fuel Provider Fleets	Municipal & Private Fleets Early/Late
1996	25%	0%	0%	
1997	33%	10%	30%	
1998	50%	15%	50%	
1999	75%	25%	70%	20%
2000	75%	50%	90%	20%
2001	75%	75%	90%	20%
2002	75%	75%	90%	30%/20%
2003	75%	75%	90%	40%
2004	75%	75%	90%	50%/60%
2005	75%	75%	90%	60%/70%
2006	75%	75%	90%	70%

Michigan Counties Covered by the Federal Alternative Fueled Vehicle Fleet Requirements



Metropolitan Statistical Areas

Detroit - Ann Arbor - Flint

Bay - Saginaw - Midland

Lansing - East Lansing

Grand Rapids - Muskegon - Holland

Kalamazoo - Battle Creek

EPAct defines the term fleet to mean: a group of 20 or more light duty vehicles (under 8,500 pounds) used Primarily in Metropolitan Statistical Areas (MSA) over 250,000 population (1980 Census), and are or could be centrally fueled. Several groups of vehicles are also excluded including law enforcement, emergency vehicles, certain military vehicles, non-road vehicles and others.

In Michigan this definition covers 23 counties which are: Allegan, Bay, Clinton, Calhoun, Eaton, Genesee, Ingham, Kalamazoo, Kent, Lapeer, Lenawee, Livingston, Macomb, Midland, Monroe, Muskegon, Ottawa, Oakland, Saginaw, St. Clair, Van Buren, Washtenaw and Wayne.

Prepared by MPSC, Dept. of Commerce. Revised 11/95

then the percentages in the "late rule" column apply.

On March 14, 1996, the Department of Energy published the final rule for implementing the AFV purchasing requirements that apply to States and fuel providers. The rule defines which state agencies and fuel providers are covered, sets up the rules for compliance and reporting, and establishes an AFV credit program. The credit program grants credits to fleets that acquire AFV's in excess of the mandate or before the year that the acquisition requirement applies. Credits can be transferred to other fleets. The final rule postpones the start of purchasing requirements from model year 1996 to model year 1997 in order to provide lead time for states and covered fuel providers to comply.

B. Incentives

The Energy Policy Act of 1992 also included federal tax incentives to encourage the purchase of alternative fueled vehicles and the development of alternative fuel refueling facilities. A 10% tax credit for electric vehicles is available for vehicles purchased after June 30, 1993 and prior to January 1, 2005. The credit is based on the purchase price and can total up to $4,000. The tax credit will be phased out in later years; the 10% credit is reduced by 1/4 in 2002, 1/2 in 2003, and 3/4 in 2004.

A tax deduction up to $2,000 per vehicle is allowed for clean-fuel vehicles that use ethanol, methanol, propane, electricity, or natural gas. The tax deduction is based on the differential cost of equipping the vehicle to use the alternative fuel. A $5,000 deduction is available for trucks and vans weighing between 10,000 and 26,000 lbs. A $50,000 deduction is available for trucks weighing more than 26,000 lbs. or busses that can seat at least 20 passengers. The deductions are available for vehicles purchased after June 30, 1993 and before January 1, 2005. A tax deduction of up to $100,000 can be claimed for clean fuel refueling sites. The deduction is available on property placed into service after June 30, 1993 and prior to January 1, 2003.

Tax incentives may also soon be available from the State of Michigan. Senator Mat Dunaskiss has sponsored Senate Bills 557 and 558. Senate Bill 557 would provide a five-year period of exemption from the State's sales tax for the additional cost associated with equipping a vehicle to use an alternative fuel. The exemption applies to both operator-owned and leased vehicles. Senate bill 557 amends the General Sales Tax Act to provide that, for sales made after December 31, 1996, and before January 1, 2002, a person subject to the sales tax could exclude from gross proceeds used for the computation of the tax the amount from the sale of an AFV, equal to the difference between the cost of the AFV and the cost that the same vehicle would have had with a traditional fuel source.

Senate Bill 558 exempts the value of an alternative fueling station from property taxes for a period of three years. The Bill would amend the General Property Tax Act to provide that an increase in the taxable value of real property due to new construction of an alternative fueling station for the retail sale of an alternative fuel for use in a motor vehicle would be exempt from taxation under the Act for three years.

Senator Dianne Byrum has sponsored Senate Bill 559 which provides an income tax credit of up to $1,500 per vehicle to individuals who purchase AFV's or convert a gasoline vehicle to run on an alternative fuel. The credit may not generate a refund, nor may it be carried forward to another tax year. The Bill would amend the Income Tax Act to provide a credit for the difference between the cost of a conventional-fueled vehicle and the cost for a comparable AFV or the cost to purchase and install AFV conversion equipment.

Senator Walter North has sponsored Senate Bill 560 which would provide a Single Business Tax Credit

of up to $1,500 per vehicle for AFV's or alternative fuel vehicle conversions. The credit cannot generate a refund, nor may it be carried forward to another tax year. The Bill amends the Single Business Tax Act to provide a credit for the differential cost between a conventional-fueled vehicle and an AFV or the cost to purchase and install AFV conversion equipment.

As of December 1996, the Michigan bills have not passed and they will have to be introduced again to be considered in 1997. As of mid-1995, 31 states have established financial incentive programs for AFV conversions.

Alabama	The main incentive for AFV's is assistance of up to $25,000 per project for conversion of fleet vehicles from the Alabama Dept. of Economic and Community Affairs. However, the 1996 program may be limited to public fleets.
Arizona	Arizona has several forms of rebates and incentives available for the purchase and use of AFV's including an income tax reduction, vehicle license tax reductions, and fuel tax reductions.
Arkansas	The major incentive for AFV's is a rebate from the Arkansas Energy Office for 50% of the conversion costs for AFV's.
California	California has a wide variety of incentives for AFV's. The California Energy Commission offers incentives of $1,000 for certified low emission vehicles (LEV's), and $1,500 for certified ultra-low emission vehicles. The state offers an income tax credit equal to 55% of the incremental cost of specified new LEV's or the conversion cost of converting a conventional vehicle to a certified LEV.
Colorado	The main incentive for AFV's is the rebate program of $1,500 to $6,000 per vehicle from the Governor's Office of Energy Conservation. In addition, Colorado offers a 5% state tax credit to vehicle owners who convert or purchase an AFV.
Connecticut	Corporations are eligible for tax credits for 50% of conversion costs of vehicles to compressed natural gas (CNG) , liquefied petroleum gas (LPG), liquefied natural gas (LNG), or electricity, or for construction costs of AFV filling stations. A 10% tax credit is available for the incremental cost of a new vehicle powered by natural gas or electricity. In addition, CNG, LPG, and LNG are exempt from the motor fuels tax.
Delaware	The Delaware Energy Office administers funding from the Petroleum Violation Escrow settlements, which can be used to finance vehicle conversions and the incremental costs of purchasing AFV's for state, county, or municipal fleets.

Florida	The main state-wide incentives for private sector AFV's are the tax exemptions for electric vehicles. In Broward, Dade, and Palm Beach Counties, the Gold Coast Clean Cities Coalition operates a low-interest revolving loan fund for AFV's, with a maximum loan amount of $5,000 to $30,000 per vehicle, depending on vehicle type and size. The State Energy Office is also using $2 million in oil overcharge funds to assist state agencies in meeting AFV requirements by paying for conversions or incremental costs for AFV's.
Georgia	The Division of Energy Resources offers a grants program and a zero interest revolving loan program to public entities to fund AFV conversions and purchases.
Hawaii	The main incentive is income tax deductions for the installation of clean fuel vehicles and refueling property. Propane used as a vehicle fuel is taxed at a lower rate than gasoline.
Idaho	Idaho has an excise tax exemption for biodiesel or ethanol.
Iowa	The Iowa Dept. of Natural Resources provides low interest loan financing for AFV conversions and purchases for state and local government and school districts, community colleges, and non-profits.
Kansas	The State of Kansas offers a state tax credit to fleets of 10 or more vehicles for conversions or purchases of AFV's. The Kansas Corporation Commission offers grants of up to $1500 per vehicle for conversion or purchase of a CNG vehicle.
Louisiana	The State offers several incentives for AFV's including an income tax credit for 20% of the incremental or conversion costs for AFV's or refueling stations. For public fleets and school districts, the Energy Division offers zero interest loans.
Maryland	State income tax credits are available for the costs of purchasing or converting vehicles. Refueling and recharging equipment are exempt from property tax. Electric vehicles are exempt from the motor fuels tax and the conversion costs for clean fuel vehicles are exempt from the sales tax.
Minnesota	The State offers incentives for the production of ethanol.
Missouri	The State offers a $.20/gallon production incentive for ethanol.
Montana	The primary incentive for AFV's is a 50% income tax credit for conversion costs.
Nebraska	The State offers low-cost and no-cost loans for conversion costs for fleet vehicles, incremental costs of factory-equipped AFV's, and installation costs for refueling facilities.
Nevada	The State provides incentives to private fleets in the Las Vegas area, and will pay for all but $1500 per vehicle for conversion to natural gas of up to two vehicles per fleet.

New Jersey	The Energy Office is using $1.5 million in oil overcharge funds to convert vehicles for use by state agencies.
New York	New York has several sales tax exemptions for various AFV's.
North Dakota	The State provides a tax credit of up to $200-$500 per vehicle on conversions.
Oklahoma	The main incentive for AFV's is a state income tax credit of 50% of the cost of converting and 10% of the total vehicle cost up to $1500 to individuals who buy an OEM AFV.
Oregon	The Business Energy Tax Credit is the major state incentive. A tax credit of 35% is available for AFV's and alternative fuel fueling stations.
Pennsylvania	The State has tax exemptions and registration fee exemptions for electric vehicles. The main incentive is the Alternative Fuels Incentives Grants Program which offers to pay 50% of conversion costs, 50% of the incremental cost for OEM AFV, and 50% of the costs to install refueling equipment.
Texas	The Texas Alternative Fuel Council and the Texas Railroad Commission make low-interest loans for the conversion of state and local government fleets.
Utah	The State provides a 20% tax credit up to $500 for each new dedicated vehicle, and a 20% tax credit up to $400 for the conversion costs for CNG, LPG, and electric vehicles. The Office of Energy Services offers a low-interest loan program for the purchase or conversion of AFV's or for the construction of refueling facilities.
Virginia	Incentives include no-charge licensing for AFV's and exemption from High Occupancy Vehicle lane use restrictions for AFV's. The State has a tax credit to 10% of the Federal clean fuel tax deduction, a 1.5% sales tax reduction for AFV's, and an AFV fuel tax reduction. In addition, the Virginia Alternative Fuels Revolving Fund provides loans to local governments and state agencies for the conversion of publicly owned motor vehicles.
West Virginia	The State has an alternative fuels grants program that provides local governments, school boards, and transit authorities up to $10,000 to convert their fleets to alternative fuels.
Wisconsin	Municipalities are eligible to apply for competitive cost sharing grants for added costs of AFV's. The maximum grant is $2500 per auto and $10,000 for trucks, vans, or buses. Each municipality is limited to a total of $50,000.

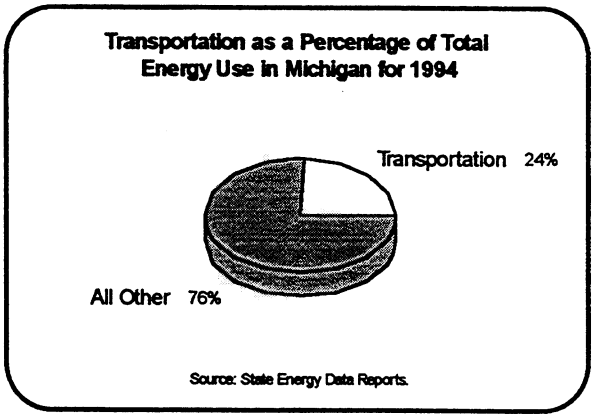
III. Michigan AFV's: Where We Are Today

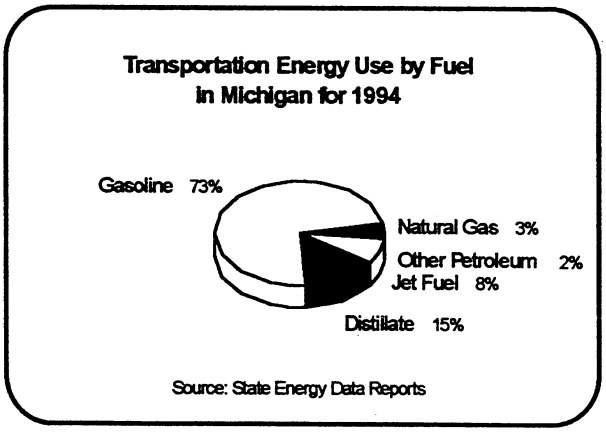
A. MichiganTransportation Energy Use

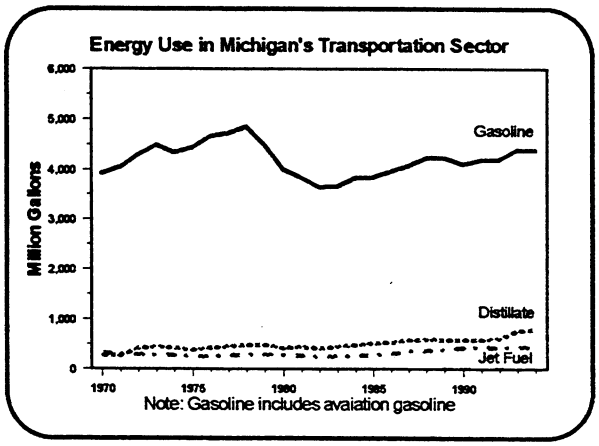
Energy used to meet Michigan's transportation needs accounted for 24 percent of the State's total energy use in 1994. Nearly all of the energy used in the transportation sector is petroleum, unlike other sectors of the economy that use coal, natural gas, nuclear and petroleum. Nearly three-fourth of our transportation energy is from gasoline. Diesel fuel used in trucks and trains is the second largest category accounting for 15 percent of the total. Natural gas is used in compressor stations to transport natural gas through the Michigan pipeline system.

Over the years, improvements in the average miles per gallons (MPG) per vehicle caused a reduction in the transportation sector's energy use. In recent years these gains have been offset by economic growth and an increase in the total number of vehicle miles traveled. Nationally, annual fuel consumption per passenger car was 504 gallons per car in 1994 compared to 771 in 1973. Annual miles driven per car has increased from a low of 9,141 in 1980 following the oil price run up due to the Iranian Revolution to 11,210 miles per year in 1994.

Michigan businesses, governments, and motorists spent $5.9 billion on petroleum in the transportation sector in 1993, of which $4.6 billion was for gasoline. Before the 1973 Arab Oil Embargo, Michigan's expenditures for gasoline only totaled $1.3 billion. Michigan's 1995 transportation fuel use was 5,459 million gallons which included 4,655 million gallons of gasoline, 797 million gallons of diesel fuel, and 6.7 million gallons of propane.







B. AFV'S by Type

There are over 6.8 million registered vehicles in Michigan including 5.35 million passenger vehicles and 1.39 commercial vehicles. As of October 1996, there are over 6,400 alternative fueled vehicles in Michigan. The total includes 5,000 using propane, 1,022 using compressed natural gas, 181 using methanol-85, 151 using ethanol-85, 81 using electricity and 3 using biodiesel. The number of propane vehicles is an estimate based on the quantity of propane used as vehicle fuel. The Energy Information Administration using a different number for propane usage estimates 13,900 propane vehicles.

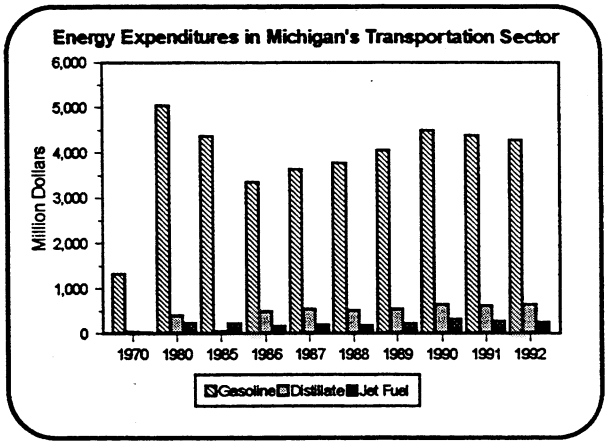
The propane vehicles are used by a variety of fleets. CNG vehicles are mostly used by utilities, state government, and the post office. The methanol vehicles are used by the federal, state, and local governments.

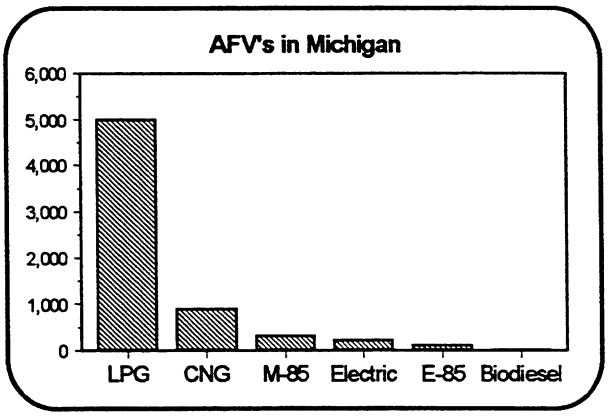
In 1996, according to the Energy Information Administration, there will be an estimated 384,952 alternative fueled vehicles operating in the United States. Propane fueled vehicles account for 80 percent of this total. Compressed natural gas fueled vehicles account for the second largest group with 60,575 vehicles (16%), ethanol (E-85) vehicles total 30,712, methanol (M-85) 11,328, and electric vehicles total 2,330.

California, Texas, Michigan, Illinois, and Ohio have the largest number of AFV's. These states account for 40 percent of the non-federal AFV's in the United States. California and Texas, however each have twice as many AFV's than any of the other states.

C. Fueling Infrastructure

There are 295 locations in Michigan supplying alternative fuels, of this number the majority of stations (219) are for propane vehicles. There are





presently 28 public CNG stations in Michigan and their number is expanding rapidly. Biodiesel does not require special fueling. The Energy Information Administration reports a total of 4,587 alternative fueling stations in the United States in 1995.

The Governors' Ethanol Coalition and the Michigan Corn Marketing Committee are working with private, retail fuel marketers to install E-85 public refueling dispensers. There will be 3 locations in Michigan in early 1997 - Lansing, Dearborn, and Detroit. A Detroit-Toronto Corridor Clean Cities Program is currently under discussion that would develop a plan for an AFV fueling infrastructure.

Alternative Fueling Stations
October 1996

	LPG	CNG	M-85	ELECTRIC	E-85	TOTAL
Public	219	28	2	0	0	249
Private	0	7	1	37	1	46
Total Michigan	219	35	3	37	1	295
Total United States	3,385	1,078	88	n/a	36	4,587

IV. Potential Benefits of AFV's

Projections indicate that the U.S. will be importing an increasing amount of oil, thus increasing the risk of future oil price shocks due to international events beyond our control. This risk can be reduced by using alternative fuels to diversify the types of fuels used in the transportation sector which is almost totally dependant on petroleum. In 1995, Michigan produced 12.2 million barrels of crude oil, only 8 percent of the state's annual consumption. The remaining 92 percent of the state's petroleum supply was imported from other states and nations. Alternative fuels can also help create jobs and provide business opportunities for automotive manufacturers, parts suppliers, vehicle conversion companies, and fuel suppliers. Finally, alternative fuels can reduce air pollution leading to a cleaner environment.

A. Energy Security, Trade Balance, and Risk Reduction

Strengthening national energy security by reducing dependence on imported oil is a primary goal of the Energy Policy Act (EPAct) of 1992. EPAct established a policy goal of displacing 30 percent of U. S. motor fuel consumption by the year 2010 (Federal Register 2/28/95).

In 1995, the United States imported an average of 7.9 million barrels of oil per day (45 % of total use) and spent approximately $50 billion to purchase imported oil. According to projections by the Energy Information Administration, the U.S. will import 11.8 million barrels of crude oil and refined petroleum products per day by the year 2010 or 57 percent of the nation's petroleum supply.

If Michigan were to achieve a proportional share of this national goal, we would displace 1.8 million gallons of oil with alternative fuels. Aside from planned increases in vehicle MPG, the greatest gains in displacing oil imports are expected to occur by replacing gasoline with domestically-produced alternative fuels.

Risk reduction refers to the vulnerability of Michigan's economy to oil price shocks. Oil price increases that occurred due to the 1973 Arab oil embargo, the 1979 Iranian revolution, and the 1990 invasion of Kuwait by Iraq all led to serious economic downturns which hit Michigan very hard. Past price shocks have triggered economic recessions and unemployment that have effected Michigan more severely than most other states. The reduction in discretionary spending that results from oil price increases leaves less money for spending on durable goods like cars, office furniture and appliances.

In addition to our durable goods manufacturers, our tourism and agriculture are effected as people change their driving habits and stay closer to home and farmers incur higher fuel costs which hurts their competitive position. Michigan used 5.5 billion gallons of petroleum products in the transportation sector in 1995. A 50 cent a gallon jump in oil prices translates into an additional cost of $2.8 billion to the Michigan economy.

In recent years, while the U.S. has become less dependent on oil imports from the Persian Gulf, the world's oil supply has become increasingly dependent on the Persian Gulf. Because oil is sold in a global market, a disruption in supplies anywhere in the world, will have an immediate effect on U.S. oil prices regardless of the source of our supply. In addition, under an International Energy Agency agreement the U.S. has agreed to share oil supplies with member nations in the event of an international oil disruption. Thus, any actions taken to reduce oil dependance benefits global oil consumers.

B. Economic Development

Given Michigan's leadership in automotive research and development and manufacturing, the development of alternative fueled vehicles is a natural and clear opportunity to retain and create jobs. Energy Conversion Devices (Troy) was the first company to be awarded a contract ($18.5 million) by the U.S. Advanced Battery Consortium for further development of their Ovonic nickel metal hydride battery for electric vehicles. In October 1996, DOE signed a $106 million four-year cooperative agreement with the U.S. Advanced Battery Consortium (Chrysler, Ford, General Motors, and the Electric Power Research Institute) to continue research and development for a long-term battery that could make electric cars competitive with conventional vehicles.

Ford has spent $50 million on its Natural Gas Crown Victoria program and has 11 Michigan suppliers working on its alterantive fuel programs. Consumers Power estimates that there are currently over 100 people employed by companies that are converting new Ford trucks and cars to run on natural gas. Lansing Township was selected as the production site for GM's new electric passenger car, the EV1. This decision means 50 jobs and a capital investment of $5.5 million for the Lansing area.

In addition to automotive manufacturing, there are business opportunities related to the production of alternative fuels and the development of the infrastructure needed to fuel and service AFV's. AFV's will require either new retail fueling stations or additional capabilities at existing retail stations. Training and new skills for maintenance personnel will be needed.

Natural gas utilities, electric utilities, propane suppliers, and other alternative fuel suppliers will have a new market for their fuels. The production of alternative fuels in Michigan such as propane, natural gas, electricity and possibly ethanol offer further opportunities. Michigan has approximately 5,300 natural gas producing wells, produces over 65,000 gigawatt hours of electricity a year, and is the nation's 8th largest corn producer - 249,500,000 bushels in 1995.

Growth in fuel ethanol production, for example, has provided an economic stimulus for American agriculture, because most ethanol is made from corn. The increase in ethanol demand has created a new market for corn and can contribute to stabilizing farm income and reducing farm subsidies, while reducing the dependence of the U.S. economy on imported petroleum. Increasing ethanol production results in a higher demand for corn and raises the average corn price. Higher corn prices reduce farm commodity program payments. At the same time, the cost of the corn protein feed co-produced from the ethanol plant is usually less than livestock protein feed which has to be imported into the area. Poultry and livestock feeders benefit from a corn processing plant due to lower feed costs.

The production of fuel ethanol is energy efficient in that it yields nearly 25% more energy than is used in growing, harvesting, and processing the corn into fuel ethanol (Shapouri, 1995). Michigan uses an average of 52.1 million gallons of ethanol per year (average 1987-1993) in fuel blending, making the state the third-largest market for ethanol blends in the nation. All of this ethanol is imported from other states.

A 50 million gallon ethanol plant in Michigan would require new investments of $83 million, with a property tax base of $41.5 million. Such a plant would mean 42 new jobs, with an annual payroll over $2.1 million. (Wolfson 1/23/96) An ethanol plant this size would require approximately 20 million bushels of corn as an input.

Corn accounts for about 90 percent of the current feedstock for ethanol production in the U.S., but other sources of biomass are being researched and

developed for ethanol production. A proposed ethanol plant in the Upper Peninsula would use paper mill sludge as its feedstock which can significantly lower production costs and also help solve a waste disposal problem.

Most biodiesel fuel in use today is derived from processed and refined soybean oil. Michigan is a key soybean state with more than 10,000 growers producing nearly 60 million bushels and contributing over $300 million from the first point of sale. Nearly all of the beans are transported via truck to processors in northern Indiana and Ohio. As soybean production has expanded in the state, the feasibility for an in-state soybean processing plant has become more apparent.

Michigan's first soybean processing plant started operating in August 1996 in Zeeland. The $8 million facility has brought 35 new jobs to the area. In addition, the plant is expected to generate over $10 million annually to the local economy in payroll, taxes, additional farm revenues and reduced feed costs.

C. Environment

The Governor's 1992 report "Michigan's Environment and Relative Risk" ranked energy production and consumption as a "High - High" risk because "The inefficient use of energy and the deleterious by-products of production and consumption threaten the economic security and environmental quality of the state and nation." Urban air pollution is a continuing and significant factor in human health. People with asthma and other lung diseases, the very young and old, healthy exercisers, and others who choose to spend time outdoors, experience health problems associated with elevated levels of ozone, particulate or carbon monoxide.

The U.S. Environmental Protection Agency estimates that mobile source emissions account for as much as half of all cancers attributed to outdoor sources of air toxics. Benzene, a product of incomplete combustion and evaporation, is a known human carcinogen. Other toxic emissions, which are by-products of incomplete combustion, are formaldehyde, acetaldehyde, and 1,3-butadiene and are probable human carcinogens. Recent studies may lead to a reclassification of 1.3-butadiene as a known human carcinogen.

Alchohol blends (ethanol and methanol) and flexible-fueled vehicles produce increased aldehyde exhaust emissions and benzene evaporative emissions. However, these and other alternative fuels produce very significant emission reductions for a number of pollutants. These fuels are inherently cleaner than conventional gasoline and diesel fuel because they contain much lower levels of benzene and have simpler chemical compounds which yield lower levels of complex combustion by-products such as 1,3 butadiene. Scientists are not yet able to assess the human health impacts of formaldehyde emissions from alternative fuels due to the bioaccumulative effects of those same emissions from other sources, such as indoor air pollution.

Motor vehicle emissions account for approximately one-third of all ozone precursor emissions (volatile organic compounds and oxides of nitrogen), two-thirds of all carbon monoxide emissions, and one-third of all carbon dioxide emissions. Carbon dioxide is a "greenhouse gas" that contributes to global warming. In general, fuels produced from biomass (crops, vegetation, etc.) and natural gas result in less carbon dioxide accumulation than fuels made from petroleum or coal.

AFV's can make a significant contribution to achieving and maintaining clean air. A recent study by Argonne National Laboratory (Wang 1993) estimates the % exhaust emission reductions compared to a conventional gasoline vehicle (See table on next page).

AFV Emission Reduction Rates (as percentage of gasoline vehicle emissions)

Fuel Type	Exhaust Emissions							Evaporative Emissions	
	Non-Methane Organic Gases	CO	NOx	1.3 Butadiene	Benzene	Formaldehyde	Acetaldehyde	NMOG	Benzene
Reformulated Gasoline	-20	-20	0	-25	-25	+20	0	-15	-25
M-85 Flexible Fueled Vehicle	-55	-10	-10	-80	-85	+280	-75	-60	+185
E-85 Flexible Fueled Vehicle	-30	-10	-10	-80	-90	+40	+825	-40	+185
Propane Dual Fueled Vehicle	-70	-30	0	-95	-95	+15	-50	-100	-100
Compressed Natural Gas Dedicated Vehicle	-90	-40	-10	-95	-99	+40	-70	-100	-100
Electric Vehicle	-95	-95	-60	-100	-100	-95	-100	-100	-100

Note: Reformulated gasoline is shown for reference purposes. It is not considered an alternative fuel.
Source: *Cost-Effectiveness of Controlling Emissions for Various Alternative-Fuel Vehicles Types, With Vehicle and Fuel Price Subsidies Estimated on the Basis of Monetary Values of Emission Reductions,* Michael Quanlu Wang, Argonne National Laboratory, August, 1993.

V. Examination of AFV Issues

A. Tax Treatment of Alternative Fuels

In Michigan, three statutes govern the taxation of fuels: the Motor Fuel Tax Act (P.A. 150 of 1927, MCL 207.101 *et seq.*), the Motor Carrier Fuel Tax Act (P.A. 119 of 1980. MCL 207.211 *et seq.*), and the General Sales Tax Act (P.A. 167 of 1933, MCL 205.51 *et seq.*). For purposes of this analysis the Motor Carrier Fuel Tax and the Motor Fuel Tax will be considered complimentary and will be referred to simply as the "fuel tax." Sales tax applies to all fuel purchases except those exempted by law .

Tax Rates -- Since 1984, Michigan has imposed a fuel tax of fifteen cents per gallon on motor fuel used for propelling vehicles on the public roads of the state. (Motor carriers may purchase a decal for their trucks, which entitles them to a six cent discount on the diesel tax rate.) Motor fuels subject to the tax include the following: gasoline and any other additive (except ethanol) to be blended with gasoline for use as a motor fuel; diesel fuel and any additives; and liquid petroleum gas, which includes propane, propylene, butylene, and butane. Gasoline that is to be blended with ethanol, however, is subject to the tax of fifteen cents multiplied by ten-ninths. In this way, fuel comprising ten percent ethanol and ninety percent gasoline, the traditional mixture termed "gasohol", results in a tax of fifteen cents per gallon. Note that an ethanol/gas mixture comprising more than ten percent ethanol is taxed at a lower effective tax rate per gallon.

Retail sales of all fuels, traditional and alternative, are subject to the sales tax of six percent. However, the Michigan fuel tax imposed is not included in the base of the sales tax. Similarly, the sales tax is not included in the tax base of the fuel tax.

Tax Exemptions -- Both the General Sales Tax Act and the fuel tax acts allow for certain exemptions. Sales tax exemptions include sales of motor fuel to schools, hospitals, certain nonprofit institutions, churches, the United States, its unincorporated agencies and instrumentalities, the American Red Cross, and the State of Michigan, its departments and institutions or any of its political subdivisions. In addition, sales of fuels for certain uses are exempt from the sales tax, such as fuel used in agricultural or manufacturing production.

Exemptions from the fuel tax include: fuel used by certain entities in the transportation of school children; fuel used in buses owned and operated by a nonprofit private, parochial or denominational school, college, or university; fuel purchased by the federal government, the State of Michigan, or any of its political subdivisions, including public colleges and universities, for use in a vehicle owned or leased and operated by the unit of government; fuel used by some community action agencies; and fuel used in taxicabs operating under a municipal license. Partial refunds of the fuel tax on diesel fuel are allowed to certain vehicles for fuel consumed on the job site.

Tax Incidence -- As the table on the next page indicates, the sales tax applies equally across all fuels. Because state-levied fuel tax is not included in the sales tax base, the sales tax does not exaggerate any relative advantage granted a particular fuel by the fuel tax.

The federal government levies two excise taxes on motor fuel, the retailer's excise tax and the manufacturer's excise tax. The federal retailer's excise tax is not included in the sales tax base, but the federal manufacturer's excise tax is. This manufacturer's excise tax is currently 18.4¢/gallon for gasoline, 24.4¢/gallon for diesel, and 8.7¢/gallon for gasohol. The sales tax amplifies the relative price advantage by applying a rate of six % to the sale price, including the manufacturer's excise tax. For gasoline, the sales tax attributable to the excise tax is 1.1¢/gallon, for diesel it is 1.5¢/gallon, and for gasohol it is 0.5¢/gallon.

Fuel	Fuel tax	Sales tax
Gasoline	15¢/gallon	6 percent
Diesel	15¢/gallon 9¢/gallon with decal[1]	6 percent
Liquid Petroleum Gas	15¢/gallon	6 percent
Compressed Natural Gas	not subject to tax	6 percent
Electric	not subject to tax	6 percent
Biodiesel	15¢/gallon	6 percent
Ethanol	not subject to tax	6 percent
Gasohol[2] (10% Ethanol/90% Gasoline)	15¢/gallon	6 percent
E-85 (85% Ethanol/15% Gasoline)	2.5¢/gallon	6 percent
M-85 (85% Methanol/15% Gasoline)	15¢/gallon	6 percent

1. Decal cost is $92 per year for vehicles domiciled in Michigan, $25 for out-of-state vehicles.
2. Gasoline that is blended with ethanol is taxed at 10/9 the usual rate, or 16.67¢/gallon; the ethanol component is not taxed. This results in a tax of 15¢/gallon for gasohol and a tax of 2.5¢/gallon for E-85.

Clearly, the fuel tax accounts for a larger variance in the rate of taxation between fuels. The differing rates result in *de facto* incentives to purchase certain types of fuel. Because ethanol, electricity, and compressed natural gas (CNG) are not subject to the fuel tax, they enjoy a relative advantage over the other fuels. At the present time, state revenue losses are minimal since vehicles using these three alternative fuels comprise only .01% of the motor vehicle population. In 1994, revenue losses from CNG used as a motor fuel were around $12,000. As mentioned above, gasoline mixed with ethanol is taxed at a higher rate, but the effective tax rate per gallon of an ethanol-gasoline mixture declines proportionately with the percentage gasoline. That is, a reduction by fifty percent of the gasoline content will halve the effective tax rate per gallon. This results in a tax incentive to operate a vehicle on a fuel that has a high ethanol content.

Section 5 of the Motor Carrier Fuel Tax Act allows vehicle owners to purchase a decal which entitles the driver of the vehicle to a discount of six cents per gallon on diesel fuel tax, thus resulting in a fuel tax of nine cents per gallon. The fee is $92 per year for vehicles domiciled in Michigan and $25 per year for

vehicles domiciled out-of-state. For in-state vehicles, the value of the discount exceeds the cost of the decal if more than 1,533 gallons of diesel fuel are consumed in Michigan. For out-of-state vehicles, the break-even point is 417 gallons. Therefore, current statute provides a relative tax incentive to users of diesel fuel if they consume more than certain amounts. Theoretically, a taxpayer could pay, on average, more than 15¢ per gallon on diesel fuel if they purchased the decal but consumed less than the break-even amount. However, it is reasonable to assume that such a case is rare or nonexistent. In FY'95, the six cent diesel discount and decal resulted in a net revenue loss to the state of $12.2 million.

Fuel Taxation Under the Motor Fuel Tax Act -- The Motor Fuel Tax Act was enacted in 1927. The structure of the Act indicates that at the time it was adopted gasoline was the only fuel anticipated to be used in the propelling of motor vehicles. Chapter 2 of the act, which introduced the taxation of diesel fuel, was added in 1951; another chapter, Chapter 3, was added three years later to tax liquefied petroleum gas (LPG).

As motor vehicle technology has evolved over the last 69 years, so has the Motor Fuel Tax Act. Thus it is not surprising to find the Act silent on many alternative fuels that are only now becoming viable options for powering motor vehicles. As such, the relative tax advantages granted to some alternative fuels should be viewed more as an artifact of emerging technologies than a conscious effort in the tax statutes to encourage the purchase of certain fuels.

Another point worth noting is that motor fuels are taxed on a per gallon basis. This method does not account for differing efficiencies and energy contents associated with different fuels. For example, gasoline has 115,000 Btu's/gallon, ethanol has 76,000 Btu's/gallon, and propane (at a pressure of about 200 psi) has 84,000 Btu's/gallon. (Wang, 1993) The State Motor Transport Division's experience with flexible-fuel methanol vehicles has shown 1/3 less MPG when compared to gasoline vehicles. Since methanol has the same tax per gallon as gasoline, the flexible-fuel methanol vehicles will pay more in fuel tax for each mile driven. Some alternative fuels, notably electricity and natural gas, are not measured in gallons. As non-liquid fuels become more common, taxation systems will need to evolve to correctly measure them. One possibility is to tax fuels on an energy equivalent basis, or according to their energy content, regardless of their volume. At least theoretically, such a tax would be more equitable, as it would tax each fuel according to its effectiveness in being used on (and therefore doing damage to) the roads.

Sen. Mat Dunaskiss has sponsored Senate Bill 1007 which amends the Motor Fuel Tax Act to provide for an alternative to the gasoline tax for an AFV. The Bill requires an owner of an AFV to purchase an annual sticker at the same time the vehicle registration is obtained. The revenue generated from this sticker would be dedicated to the Highway Transportation Fund. The annual price of the sticker would be set based on the percentage of AFV's registered in Michigan. Senate Bill 1008, also sponsored by Sen. Dunaskiss, would amend the Michigan Vehicle Code to require the application for a vehicle title to indicate whether the vehicle uses an alternative fuel. As of November 1996, these bills have passed the Senate.

State Level Taxes That Affect Fuel Producers - - There are several taxes levied at the state and local level that can affect producers of alternative and conventional fuels. These include the sales and use taxes, motor fuel tax, various forms of property tax, single business tax (SBT), income tax, and severance tax. The sales and use taxes and property tax apply to all producers equally. The motor fuel tax on the fuel that producers use in their own vehicles will depend on their choice of fuel. Of course, alternative fuel providers are required by EPAct to purchase AFV's.

The other taxes (SBT, income tax, and severance tax) have differential impacts according to the type of fuel being produced and to the business structure of the producer. The structure of the business determines which taxes apply to producers of conventional fuels. If the producer is an unincorporated entity, only the severance tax, which is levied on the income arising from oil and gas severed from the ground, applies. A producer which is an incorporated business must pay severance tax and SBT (if its meets the filing threshold of $250,000 in annual gross receipts).

The tax treatment of producers of alternative fuels depends on the type of business and the type of fuel being produced. Producers of CNG face the same treatment described above for conventional fuels because natural gas is severed from the ground. For all other alternative fuels, the severance tax does not apply. The producer will pay only the SBT if it is a corporation. If the entity is unincorporated, such as a sole proprietorship or partnership, the entity will be subject to the SBT and the members will potentially owe income tax on their distributions.

This complex set of results stems from recent case law interpreting the Severance Tax Act's provisions that the tax is to be in lieu of all other taxes. This area of tax policy is still very much in flux and will continue to evolve. The current playing field is less the result of conscious public policy than it is of judicial interpretation.

B. State Motor Vehicle Fleets

There is one fleet operation within the State, the Department of Management and Budget's Motor Transport operation, which is a centrally managed fleet for all departments. A desire to assure cleaner air and to improve our nation's energy independence has resulted in a strong commitment to the successful integration of alternative fueled vehicles into the state fleet.

The total state fleet size is 11,000 vehicles. Of this total number, 6,000 vehicles are subject to the EPAct provisions dealing with AFV. In a typical year the number of vehicles ordered for the effected group of vehicles is 1,150 vehicles.

Critical Issues -- Before alternative fueling is capable of sustaining its own existence, three critical issues require resolution:

1. The need for an extensive statewide public fueling infrastructure.

The vast majority of the state fleet is very transient. The routing of the vehicles typically does not include a consistent fueling site. Due to this high mobility, the lack of a fueling infrastructure is a limiting factor for placement of vehicles into the state fleet. To assure that the numbers of alternative fueled vehicles will increase at the desired rate, the State works closely with fuel providers to identify state fueling requirements.

2. Original equipment vehicle availability from the manufacturers is necessary to reduce alternative fueled vehicle acquisition costs and to assure the availability of competent maintenance for new technology.

At the present, manufacturers' offerings are limited.

3. Current economic justification of alternative fuels is difficult as higher acquisition costs (related to minimal volumes and extensive technological research dollars required) are not offset by operating benefits.

Along with these higher costs additional depreciation impact exists, with the potential of a reduced resale market. Depreciation, which is already 50 percent of vehicle cost, will increase even more if the retail driver does not identify any alternative fuel benefit and is therefore unwilling to

State of Michigan Alternative Fueled Vehicle Acquistion Plan

Number of Vehicles by Fuel and Model Year	Actual					Projected			
	1993	1994	1995	1996	Total	1997	1998	1999	Total
Electric	22	0	0	0	22				
Alcohol Fuels	59	5	7	0	71				
Compressed Natural Gas	2	11	109	55	177				
Propane	0	0	0	5	5				
Total AFV's	83	16	116	60	275	325	440	585	1625
Total Vehicle Orders	1147	1148	1146	1155	4596	1160	1165	1170	8091
Annual % of New Vehicle Acquisitions	7%	1%	10%	5%	6%	28%	38%	50%	20%
EPAct Annual Mandate %						10%	15%	25%	7%
EPAct Mandated Orders						116	175	293	584

pay fair market value for State vehicles upon resale.

Alternative Fuel Vehicle Testing -- The state fleet operation began research of alternative fueled vehicles several years ago. The research focused on *technology, fuel and vehicle availability, cost and application* of various AFV's. As a result, an aggressive testing program was begun with 1993 model year vehicles. The initial test involved 83 vehicles representing various AFV options: compressed natural gas (CNG), electric, ethanol and methanol.

The vehicles were placed in a controlled environment where accurate usage of fuels is identified and the reliability of test data and operations for each respective fuel assured. The controlled environment also assures adequate driver education and user feedback.

- All vehicles have preformed normally with no significant operating failures.
- Emission testing results for all of the alternative fuels identify significantly cleaner emissions than that of a gasoline fueled engine. As it is early in the testing process (18 months), we do not as yet have adequate measurements that show the effects of the mileage and fuel blend on the emissions from these fuels.
- Engine wear testing has been conducted, but early mileages do not yet define accurate trends or conclusions. Methanol fuel test results create the greatest early concerns as readings for iron were the highest and twice the readings for gasoline. This high level provides a definite potential for erosion of internal combustion parts.
- Methanol fuel pricing has been volatile and is having a significant impact on the operating costs of these fueled vehicles.

By responsibly testing and educating drivers, we believe Michigan is and will continue to be a leader

in AFV use.

State Fleet Activities for Promoting Alternative Fuels --

- Development and attainment of a continuing five year plan.
- DMB has ordered and operated electric, ethanol, methanol, propane, and natural gas vehicles. Vehicles have been placed throughout state departments including Agriculture, Consumer & Industry Services, Corrections, Management and Budget, Natural Resources, Family Independence Agency, State Police, and Transportation.

- Transportation has replaced numerous motorized construction signs with electrical power sources.

- Extensive testing of air quality, engine performance and engine wear for all alternative and gasoline fueled vehicles continues. Testing to date has confirmed some basic facts and costs regarding fuel efficiencies and performance. No fuel has been eliminated from usage as of this date.

- Continued training for all state departments, universities and other interested personnel.

- Participated on Federal Fleet Conversion Task Force created to expedite the usage of alternative fuels.

- Constant communication with the Department of Energy alternative fuel data base to obtain fuel performance results for education and comparison.

- Comparison of alternative fuel data with other active alternative fueled fleets.

- Federal Grant Project on ethanol fuel usage. Assisted by various State and Federal agencies for identification of available grant monies.

- Continuing communications with several vendors to develop public fuel sources for CNG, ethanol, methanol and propane. Ethanol and methanol fuel sources have been established at the DMB's Secondary Complex site until the public stations are adequately developed.

- Working with General Services Administration, municipalities, universities and the private sector to generate a concentrated grouping of vehicles to promote the development of alternative fuel vendors for all aspects of the industry (fueling, conversion, maintenance, training, etc.)

- Committed to evolving with the industry and staying current with rapidly advancing technology.

The State is working to expand alternative fuel usage with thorough planning and evaluation. With this objective, the State will meet Federal legislation in the true spirit in which it was intended - energy independence and clean air. The State will continue to meet mandated numbers, not just with vehicles capable of operating on alternative fuels but with vehicles which actually do. Focused research will assure the State of Michigan that its fleet will enjoy maximum energy and clean air benefits at the lowest possible cost.

C. Special Parking

Special parking can be considered in two ways. First, the privilege of parking an alternative fueled vehicle in a choice location, and second, the necessity of special parking needs, such as refueling connections.

Privileged Parking --Although it is possible to establish a license plate identification scheme (commonly referred to as "the green plate" with

green referring to the environment and not necessarily the color of the plate) which designates an AFV, it is extremely difficult to enforce a system of mandatory parking privileges both from the standpoint of available human resources and funding. However, there is significant potential for special parking privileges where assigned parking, special underground parking, or leased parking is available. In such cases, AFV's could be treated like car pool vehicles, often being assigned the "preferred" parking by private companies, or in cases where waiting lists are maintained, (such as the State of Michigan's underground parking system), by assigning priority on the waiting list. Any privileged parking program should generate enough revenues to cover program expenses.

Special Parking Needs -- A second aspect to special parking is related to infrastructure development issues. Some vehicles, such as electric cars or cars using CNG, require long refueling times. In cases where infrastructure can be combined with a parking facility, it may be necessary to advertise or even restrict parking to vehicles that can use the refueling receptacles--examples are special electric connections and natural gas compressor connections. Because AFV's sometimes have limited ranges of travel, refueling and recharging considerations may be necessary to promote their use.

D. Public Education

There are three issues that may concern potential users of AFV's: availability of fuel and maintenance services, economics (i.e. life cycle costs and benefits of AFV's), and safety. Environmental benefits may be a significant motivator to encourage the use of AFV's. The availability of public incentives, e.g. tax credits, could also be a significant motivator. A different aspect of public education is training public officials responsible for safety on how AFV's differ from conventional vehicles.

Target audiences for a public education program include:

1. fleet managers
2. purchasers at fleet auctions
3. environmentally concerned individuals
4. urban commuters.
5. policy makers and code officials
6. emergency responders such as police fire, and medical technicians

Public education programs might also be targeted at Michigan counties where federal AFV mandates apply. (See map on page 3).

Fleet Managers -- Fleet managers who manage large numbers of vehicles are a good target audience because they are in the best position to evaluate, understand, and capture benefits of AFV's. Fleet managers will have to be convinced that AFV's are economical and safe and that they will be able to readily obtain fuel and maintenance services. An AFV newsletter, case studies, and conferences can be used to share information between fleet managers on the pros and cons of the various alternative fuels. State government experience with AFV's can be shared with other fleet managers.

State Auctions -- Purchasers at fleet auctions are an inevitable target audience since the State fleet is mandated to purchase AFV's and will be selling them at auctions. Purchasers of fleet vehicles will have to be convinced that AFV's are economical and that there are no problems related to safety, fuel, and maintenance. Targeted mailings can be made to auction attendees to address potential concerns. State government experience with AFV's can document lack of problems and alleviate any concerns of potential purchasers of fleet AFV's.

Environmental Recognition -- Environmentally concerned individuals are a potential target audience because of the environmental benefits of using AFV's. Some type of recognition, e.g. special license plates, bumper stickers, or decals, would be an important component of any effort to reach environmentally conscious individuals. Brochures,

presentations, and other education efforts targeted at members of environmental organizations could be used to reach this audience.

Commuters – Urban commuters, particularly those in two-car families, may be a good target audience if the fueling infrastructure exists in their urban area. Two-car families will not have to be as concerned about vehicle range or fuel availability outside of the urban area. Appeals to urban commuters will have to overcome economic, safety, and availability issues that may concern them. Urban commuters can best be reached through employers.

Fueling Sites – In addition to these targeted public education efforts, the State of Michigan can help AFV owners identify fueling sites. State highway signs or displays at rest areas could be used to make drivers aware of the availability of alternative fueling sites. The hour of operation and location of fueling locations for the various alternative fueling sites could be provided on a computerized listing that can be remotely accessed and easily updated. The Energy and Regulatory Matters Information Service (ERMIS) could be used for this purpose at no additional cost. ERMIS is currently being used for the Fill It Up Program which provides the location of retail stations which will pump gasoline for individuals with disabilities at the self serve price. The listing of these stations is by county and can be directly accessed by the public. Highway tourist centers and libraries also know how to access the information.

Implementation would involve two steps. (1) compiling the listing of alternative fueling stations by county and then loading the information on ERMIS and providing a means for regular updates as required, (2) developing a marketing strategy to make individuals aware of the availability of the information. Marketing could include a mailing to fleet managers, press releases and using the same outlets as the Fill It Up Program. A printed version of the list should also be prepared and distributed.

After developing this capability, if a more advanced approach seemed warranted, the information could be presented on the ERMIS world wide web site. This would allow for a graphic representation of the state with the various locations plotted on a map. By clicking on a selected location one might be able to either zoom in on the area to see a more detailed map of the location or a text file could be displayed which would give the station name, address, phone, major cross roads, hours of operation and any other information that might be useful.

Public Safety – Special training should be provided to law enforcement officers, fire services, emergency medical service providers, and other public safety personnel who arrive on the scene of an AFV crash. Emergency personnel must be able to identify the specific type of fuel and secure the scene so rescue work can begin. They also need to know when to call for trained personnel equipped with proper protective gear for assistance. The National Highway Traffic Safety Administration has prepared a brochure (Approaching Alternative Fueled Vehicle Crashes) to help educate emergency responders.

A public education program in Michigan could include the following components:

1. Use of a computerized database to assist AFV owners to identify fueling sites in Michigan.

2. Use of a display(s) or state highway signs to make drivers aware of the availability of alternative fuel sites.

3. Recognition for AFV's to encourage environmentally conscious individuals, businesses, and public agencies to purchase AFV's.

4. Sharing state motor fleet AFV experience with potential purchasers of auctioned state AFV's and other vehicle fleets.

5. Work with urban employers on a pilot basis to encourage their employees to use AFV's.

6. Training programs for policy makers and code officials.

7. Training programs for emergency responders such as police, fire, and medical technicians.

E. Clean Cities

The Clean Cities Program (CCP) is a federal initiative designed to expand the use of alternative fuels and AFVs. The program, coordinated by the U.S. Department of Energy (DOE), encourages local governments and businesses to form partnerships in developing local fleet markets for AFVs. The stakeholders in these partnerships may include: state and local government agencies, schools, colleges and universities, private fleet managers, vehicle and equipment manufacturers and suppliers, fuel providers, and environmental and consumer groups.

A designated Clean City may be one or more cities or counties, a metropolitan region or an entire state. As of November 1, 1996, DOE has designated 49 Clean Cities including: Atlanta, Boston, Chicago, Philadelphia, San Francisco, western New York, Florida Gold Coast, Southeast Wisconsin, and the State of West Virginia.

Why Is The Program Important? -- By encouraging the use of alternative fuels, the Clean Cities Program seeks to reduce the nation's heavy dependence on imported oil. Participation helps communities comply with the environmental regulations of the Clean Air Act Amendments of 1990 (CAA) and with fleet purchase requirements of EPAct. A Clean Cities designation increases opportunities for federal funding of alternative fuel projects.

Clean Cities participation offers additional benefits to some Michigan communities. It supports major centers of vehicle and/or vehicle parts manufacturing; contributes to local economic development by stimulating fuel infrastructure investment and creating service sector jobs. It is a proactive approach toward improving air quality, and demonstrates environmental responsibility in meeting the state's clean air goals.

What are the Required Steps? -- Notify the DOE Regional Support Office in Chicago of program interest. Appoint a local Clean Cities Program Coordinator who can responsibly represent municipal government(s) and who has ready access to public decision-makers. Identify and meet with local stakeholders to establish an organizational structure for plan development. Develop an action plan that outlines goals, objectives and the organizational structure of the program. Draft and sign a non-binding memorandum of understanding (MOU) between the program organization, its stakeholders and DOE. In cooperation with DOE, arrange the media event to receive the Clean Cities designation. Implement the plan and projects.

Who are Likely Candidates in Michigan? -- EPAct identifies Metropolitan Statistical Areas (MSAs) as the broad geographic areas that are subject to EPAct fleet purchase mandates. While other regions may also participate in the Clean Cities program, those in five designated MSAs are the most likely candidates. These include: Detroit-Ann Arbor-Flint, Lansing-East Lansing, GrandRapids-Muskegon-Holland, Kalamazoo-Battle Creek, Saginaw-Bay City-Midland. In addition to the named cities, twenty-three Michigan counties fall under the same fleet purchase mandates.

The City of Detroit and its surrounding seven metropolitan counties applied for Clean Cities membership in late August. The project proposes an international Clean Cities Corridor for AFV market development between Metro Toronto and Detroit. Designation ceremonies are expected to be held in December. The City of Lansing is currently

assessing the support in its metropolitan region to develop a similar program application.

Barriers to Participation? -- In comparing the costs and benefits of developing a community or regional marketing plan for AFVs, Clean Cities may seem less compelling in Michigan. During 1995, the entire state met EPA Tier I standards for air quality and therefore, is not subject to the Clean Fleet mandates of the CAA of 1990. Fleet purchase mandates for municipalities and businesses under EPAct may not be decided for another two years, if then. Any decision to join the Clean Cities Program in Michigan will be a choice that focuses more on its potential for maintaining air quality standards or promoting local economic development.

Since the State imports most of its transportation fuels, the economic impact of expanding AFV use and refueling facilities may be lower in the near term than if Michigan produced and exported large quantities of alternative transportation fuel such as in Illinois. However, several models of vehicles and vehicle parts that are optimized for alternative fuel use are manufactured in Michigan. A Clean Cities Program could help expand local markets for these products and the necessary support services.

What State and Federal Assistance is Available? The Energy Resources Division (ERD), Michigan Department of Consumer and Industry Services offers information and financial assistance to promote AFVs and the Clean Cities Program. ERD recently offered grants to encourage Michigan Clean Cities participation. This office also coordinates the submission of project proposals for federal assistance.

Since 1993, DOE has awarded $1-$2 million annually for AFV demonstrations and market development initiatives. Most of these grants have been awarded to Clean Cities' participants. Michigan has not yet received one of these awards.

Periodically, DOE offers financial assistance for other AFV-related activities. In 1995, the City of Lansing and the Ecology Center in Ann Arbor received grant awards for AFV public education. DOE also offers technical and program information through its toll-free hotline, annual conferences, teleconferences and World Wide Web site.

F. Treatment of Sales of Alternative Fuels

The Michigan Department of Agriculture administers two statutes, the Motor Fuels Quality Act and the Weights and Measures Act, which impact the treatment of sales of alternative fuels. Significant new amendments to these Acts should be added in order to properly regulate the quality, quantity, and sale of alternative fuels for use in alternative fueled vehicles. An outline of each of the items for each statute follows.

Motor Fuels Quality Act -- The Motor Fuels Quality Act neither currently prohibits nor recognizes the sale of alternative fuels. If the fuel is being sold as a "gasoline" the Act regulates the labeling of the dispenser to ensure that misfueling does not occur. The Act does not establish standards or controls beyond labeling of fuels sold as "gasoline." If the fuel is being sold under a name or representation other than "gasoline" the Act does not address this.

To regulate the quality, sale and use of alternative fuels, amendments should be made to the Motor Fuels Quality Act as outlined:

290.642 add definitions for alternative fuels

290.643 add standards for alternative fuels *

290.644 add alternative fuels to current gasoline sale and labeling requirements

290.645 add additional section to deal with water content in alcohol based fuels. Add alternative fuels to current gasoline invoice requirements

290.646	add alternative fuels to current licensing requirements (if not already licensed for gasoline sales)
290.647	add testing for alternative fuels standards* and to hotline response and paperwork requirements
290.648	add alternative fuels to insure money received for alternative fuels enforcement goes into the gasoline inspection and testing fund

* National consensus standards exist for some, but not all of the alternative fuels. Until consensus standards are developed the director may require registration of the fuels specifications by the marketing firm. The fuels can then be tested to ensure that they meet the specifications being sold under so consumers have some assurance of a baseline standard for these fuels. Furthermore, testing for biodiesel and CNG fuel standards is beyond the scope and capability of our current laboratory facilities and equipment.

Additional amendments will be needed to clarify the Act and/or delete outdated information.

Weights and Measures Act -- The Michigan Weights and Measures Act prescribes the regulation of most commodities' content measurement and labeling and is based upon the need for both the seller and buyer to be assured of accuracy and truthfulness so competition cannot be based on false or misleading measurement. Proposed amendments to the Weights and Measures Act do not include the measurement of electricity as a vehicle fuel, but does include ethanol, methanol, liquid petroleum, compressed natural gas (CNG), and diesel. CNG is the only fuel of the above whose method of sale is currently not defined. The amendments for the Weights and Measures Act include the adoption of the model NCWM (National Conference of Weights and Measures) Method of Sale Regulation. Natural gas sold at retail as a vehicle fuel shall be in terms of either the gasoline liter equivalent (GLE means .678 kg of natural gas) or gasoline gallon equivalent (GGE means 2.567 kg or 5.66 lb. of natural gas). The GGE was formulated to allow the comparison of CNG to gasoline on a "gallon" basis. Federal initiatives may someday make the metric method of sale the preferred method of labelling and sale in the United States.

The amendments include the following:

1. General update of the Act to include the most recent version of the National Institute of Standards and Technology (NIST) Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices.

2. Adopt NIST Handbook 130 by reference (or similar language) in the following areas:

a. The Method of Sale of Commodities;
b. The Voluntary Registration of Service Persons;
c. Requirements for Packaging and Labeling

3. Additional amendments to clarify the Act and/or delete outdated information.

G. Public Utilities and Rate Treatment

Public utilities in Michigan are affected by the federal AFV fleet requirements in three ways: First, the utilities must purchase AFV's to comply with EPAct mandates. Second, they need a refueling infrastructure to operate their fleets. Third, as providers of energy service they may be part of the infrastructure for refueling natural gas and electric AFV's. EPAct does not require public utilities to invest in refueling infrastructure or to promote the use of AFV's.

The Michigan Public Service Commission (MPSC) recognizes the EPAct mandate to purchase AFV's and will allow utilities to recover the reasonably incurred costs associated with purchasing, operating and maintaining a fleet of AFV's. The MPSC allows utilities to recover costs that are reasonably and prudently incurred to provide service to their

customers. The cost of purchasing, operating and maintaining a fleet of AFV's would be treated the same as any other plant investment and operating expense for purposes of setting rates.

The utilities are faced with several choices for refueling AFV's: (1) they may own and operate refueling facilities dedicated to their own fleets, (2) they may own and operate refueling facilities that are open to the public, (3) they may refuel their fleets at public facilities, or (4) they may choose any combination of the above.

Utilities' investment in refueling facilities may be recovered from their customers through base rates to the extent that such facilities provide service to the customers of the utility. The MPSC will not allow public utilities to compete unfairly against private investors for the public refueling market. The market should decide which entities are the most efficient providers of a service. Private operators may be able to provide the refueling service at a lower cost, if they are allowed to compete. For this reason it is essential that the MPSC not interfere with the market's decision by allowing utilities to subsidize the ownership and operation of public refueling stations for AFV's. Nothing in this statement should be construed as precluding any utility from privately investing in public refueling stations for AFV's.

The MPSC does not endorse one alternative fuel over any others. Public utilities, like other businesses, may choose to spend private funds to promote the AFV of their choice, without MPSC approval. They will not be allowed to recover the cost of such promotional practices from their customers, since they are not essential to the provision of utility services. The MPSC recognizes that electric utilities may choose to promote electric vehicles, while natural gas companies may promote CNG vehicles and invest in the refueling infrastructure. A utility's decision to promote or invest in any AFV program is no different than any other non-utility investment and is within the sole discretion of the utility's management. AFV programs will have to compete for utility stockholder funds with other investment opportunities. They may attract funds on the basis of expected profitability or by meeting other corporate criteria developed by the management of each utility.

The MPSC is involved in the pricing of the fuels for both natural gas and electric vehicles. The MPSC has approved an experimental off-peak rate (Rate D 1.7) for the Detroit Edison Company for recharging electric vehicles. It has, also, approved two experimental rates for Consumers Power Company. Consumers Power Company's Rate B-NGV provides for the sale of natural gas to refueling stations. Its Rate T-NGV allows refueling stations to purchase their own gas and have it transported to their facility by Consumers Power Company. There are presently no customers served under Rate T-NGV, and service on this rate is not available after December 31, 1996. The MPSC has determined that it is appropriate to allow the market to set the retail price of the fuel at the pump. While it is the responsibility of the station operators to set the retail price at the pump, the MPSC will continue to set the rates that utilities charge for the sale of naturalgas or the transportation of natural gas to the station operators.

H. Traffic Safety Prohibitions and Storage and Dispensing Facilities

The Michigan State Police, Fire Marshal Division and Motor Carrier Division researched applicable traffic safety prohibitions and storage and dispensing facilities rules as they relate to alternative fuels. The Motor Carrier Division has indicated that there are no traffic safety rules or prohibition of alternative fuels that are under their jurisdiction. The Fire Marshal Division has responsibility by law for flammable compressed natural gas and liquefied petroleum gas storage or filling locations under the Michigan Fire Prevention Code, Public Act 207 of 1941, as amended.

Act 207 states in part that (1) a firm or person shall not establish or maintain a flammable compressed gas or liquefied petroleum gas container filling location without obtaining a certificate from the state fire marshal; (2) the State Fire Safety Board (within the Fire Marshal Division) shall promulgate rules for the storage, transportation, and handling of hazardous material and for the implementation of this act; (3) a certificate shall be issued by the state fire marshal after the initial inspection and issued every 3 years after the state fire marshal determines by an inspection that the firm location is in satisfactory compliance with the rules. Each firm shall submit an installation application to the state fire marshal and pay a fee of $203 per tank and an annual fee of $61.50 for each filling location specified in Section 5c.

The Compressed Natural Gas and Liquefied Petroleum Rules have been promulgated as of January 13, 1996. The Compressed Natural Gas Rules adopt the 1992 edition of NFPA 52 by reference (National Fire Protection Association Pamphlet 52, Standard for Compressed Natural Gas Vehicular Fuel Systems). The Liquefied Petroleum Gas Rules adopt the 1984 edition of NFPA 59A by reference (National Fire Protection Association Pamphlet 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas).

As new compressed natural gas dispensing facilities are constructed, the Fire Marshal Division will inspect them under the proposed rules and make any needed recommendations to assure the facilities are constructed in accordance with the fire and explosion safety standards as noted above.

Ethanol and methanol fuels are also regulated under the same rules as gasoline and are the responsibility of the Fire Marshal Division.

I. Public Transit Services

There are 2,600 public transit vehicles operating in Michigan. Approximately 66 of these buses are alternative fueled vehicles or will be ordered as alternative fuel vehicles. The agencies are:

- Manistee Co. - 22 propane
- Grand Haven - 6 propane, 1 electric trolley to be ordered
- Big Rapids - 9 propane
- Mecosta/Osceola Cos. - 15 propane
- Midland - 1 propane
- Port Huron - 8 CNG
- Detroit Dept. of Transportation (DDOT) - currently ordering 6 CNG

In addition, the Flint Mass Transportation Authority has experimented with soydiesel. The test program consisted of a bus using conventional diesel fuel and a second bus using a soydiesel blend. Although more expensive, the soydiesel fuel was used to reduce particulate matter, carbon monoxide, and sulfur dioxide. The soydiesel test program did not require new fueling capabilities, new parts inventories, or engine modifications.

These agencies will provide an information base for the other transit agencies in the state. MDOT will act as a central information database on the successes and concerns experienced by the agencies currently operating alternative fueled vehicles. MDOT will also disseminate new information and data on alternative fuels research including information on the State's own fleet of AFV's to the transit agencies to encourage their interest and participation in purchasing AFV's. MDOT will assist transit agencies in overcoming barriers to purchasing AFV's.

J. Intermodal Surface Transportation Efficiency Act of 1991

Until 1997, Congestion Mitigation and Air Quality Improvement (CMAQ) funding is available through the Intermodal Surface Transportation Efficiency Act of 1991. Under general guidelines, CMAQ funding is available for revenue producing vehicles such as busses that use alternative fuels. The

customary interpretation of this requirement is that transit vehicles and fueling stations are eligible for CMAQ funding. At the present time, all CMAQ funds are programmed according to the State long-range plan. Funds are not expected to be available after 1997.

At present, only non-attainment or maintenance areas designated under the Clean Air Act are eligible for projects. In addition, certain demonstration projects can qualify for CMAQ funding with relatively few restrictions. Some of these projects could include the use of alternative fueled vehicles.

K. AFV Credits & Emissions Trading

Section 508 of the Energy Policy Act (EPAct), as proposed, requires the Department of Energy (DOE) to establish an alternative fueled vehicle credit program that will allocate vehicle purchase credits, on a per-vehicle basis, to affected fleets or persons, if AFV purchases exceed the minimum amount required. These credits may be used to comply with program purchase requirements in a later year, or may be traded or sold for use to another fleet or person covered by the EPAct.

The purpose of the credit trading program is to provide purchasing flexibility for the regulated fleet operators without sacrificing the program's energy security goals. Credits may be traded freely among those affected by the EPAct anywhere within the United States. Because one of the major goals of EPAct is the reduction of the dependency on foreign oil, it makes little difference where in the United States this reduction takes place.

The DOE will establish a database that will keep a record of credit allocations, trades, and credit balances, as well as a credit account for each fleet or covered person who obtains an alternative fueled vehicle credit. An annual report will be required of all fleets or persons who have generated or traded credits to record and track their credit activity.

The Federal Clean Air Act Amendments of 1990 (CAA) encourage the use of market-based approaches to assist in attaining and maintaining the National Ambient Air Quality Standards for all criteria pollutants. Under CAA requirements, the EPA has developed a program called the Clean Fuel Fleet Program. The CAA defines "Clean Fuel" as any fuel or power source that enables a vehicle to emit less pollution than would be the case with conventional gasoline or diesel fuel. These include alternative fuels and specially reformulated gasoline and diesel fuel. This program provides credits based on a formula that compares the clean fuel vehicle emissions with conventional vehicle emissions. Trading is allowed only within the same non-attainment area. However, there are no areas in Michigan which are required to participate in EPA's Clean Fuel Fleet Program. The CAA also encourages "emission trading" to provide incentives for sources to reduce emissions beyond any applicable requirement and to improve air quality.

A voluntary statewide air emission trading program has been developed by the Department of Environmental Quality (DEQ). The program is designed to improve air quality, create market-based incentives, encourage early emission reductions and technological innovations, provide operational flexibility and more cost-effective compliance with current and future air quality regulations. The rules allow alternative fueled vehicle credits to be traded, or retained for future use, based on emission reductions, as in the Clean Fuel Fleet Program, but not on a per-vehicle basis, as in the EPAct credit trading program. Actual reductions must be quantified in units of "tons" per year or ozone season. There is no limit on where the Emission Reduction Credits (ERC's) could be traded. Any person, stationary, area, or mobile source may participate in the program. The administrative rules necessary to implement the program became effective on March 16, 1996.

VI. Findings

1. EPAct – The passage of EPAct in 1992 has set in motion a series of requirements and incentives to promote the introduction and use of alternative fuels in federal, State, and private vehicle fleets over the next eight to ten years. Since state government is required to purchase AFV's, state government would benefit from a greater availability of AFV's from manufacturers and the development of an alternative fueling infrastructure.

2. Fueling Infrastructure – There are presently over 6,400 AFV's in Michigan, .09% of total vehicles registered. There are 249 retail stations providing alternative fuel (88% of these are propane) compared to about 5,000 retail stations providing gasoline. A greater use of AFV's will only occur if an alternative fueling infrastructure is developed. The current lack of an infrastructure to support AFV's is a critical deterrent to the purchase of AFV's.

3. Potential Benefits of AFV's -- A greater use of AFV's and alternative fuels would contribute to significant energy security, trade balance, risk reduction, economic development, and environmental benefits for Michigan.

4. Fuel Taxes – The different fuel tax rates result in *de facto* incentives to purchase certain types of fuel. Because electricity and compressed natural gas (CNG) are not subject to the motor fuel tax and ethanol is taxed at a rate that assumes a 10% ethanol/90% gasoline mix, they enjoy a relative advantage over the other fuels. Since CNG is not subject to the fuel tax, the State in 1994 lost approximately $12,000 in tax revenues. The diesel discount of 6 cents per gallon and the decal program resulted in net lost revenues of $12.2 million in FY95. Legislation recently introduced in the Michigan Senate would institute an annual highway use sticker and fee for vehicles using alternative fuels. If the legislation is enacted all alternative fuels would have the same fuel tax rate.

5. State Motor Vehicle Fleet – The state vehicle fleet managers have been proactive in the planning, acquisition, and evaluation of AFV's. The State is presently operating 275 AFV's and has plans to purchase an additional 1,350 AFV's over the next three years. The state vehicle fleet has exceeded EPAct purchasing requirements, experimented with a variety of different types of AFV's, and cooperated with private fuel supplies on the development of the alternative fueling infrastructure. As a result, the State has gained the experience it needs to successfully meet federal purchasing mandates.

6. Special Parking – Some AFV's, e.g. electric vehicles, have limited driving range at the present time and may need to be recharged/refueled during the day at parking sites. Special parking with recharging/refueling capabilities may be needed for certain types of AFV's.

7. Public Education – The general public and most fleet managers know very little, if anything, about alternative fueled vehicles. Potential concerns include availability of fuel and maintenance services, economics, and safety. Environmental benefits and public incentives, e.g. tax credits, may be significant motivators to encourage the purchase and use of AFV's. A public education program could help the public and fleet managers make informed decisions about alternative fueled vehicles and assist them to locate fueling sites that have alternative fuels. Special training is needed for law enforcement officers, fire services, emergency medical service providers, and other public safety personnel who arrive on the scene of an AFV crash.

8. Clean Cities – Participation in Clean Cities

helps communities comply with the fleet purchase requirements of EPAct and increases opportunities for federal funding of AFV projects. Clean Cities participation offers additional benefits to Michigan communities. It supports major centers of vehicle and/or vehicle parts manufacturing; contributes to local economic development by stimulating alternative fuel infrastructure investment and creating service sector jobs. It is a proactive approach toward improving air quality and demonstrates environmental responsibility in meeting the state's clean air goals.

9. Treatment of Sales of Alternative Fuels -- The Motor Fuels Quality Act and the Weights and Measures Act are needed for both buyers and sellers of alternative fuels to be assured of accuracy and truthfulness so competition will not be based on false or misleading information. The Acts do not currently regulate the quality, quantity, and sale of alternative fuels for use in AFV's.

10. Availability of Alternative Fuels -- State and local governments can increase the overall accessibility of alternative fuels by supporting and using retail fueling stations.

11. Public Utilities -- The Michigan Public Service Commission regulates the wholesale cost of natural gas. It does not regulate the retail price of natural gas sold as fuel for motor vehicles. The MPSC does regulate electric rates for the recharging of electric vehicles. Utility costs to purchase and operate AFV's mandated by EPAct can be recovered from natural gas and electricity customers. Nothing precludes a utility from privately investing in retail alternative fuel stations.

12. Intermodal Surface Transportation Efficiency Act of 1991 -- Until 1997, it is possible that CMAQ (Congestion Mitigation and Air Quality Improvement) funding could be used for revenue producing vehicles such as busses that use alternative fuels. However, presently all CMAQ funds are programmed according to the State long-range plan. Funds are not expected to be available after 1997. At present, non-attainment or maintenance areas designated under the Clean Air Act are eligible for projects in this funding category. In addition, certain demonstration projects can qualify for CMAQ funding.

13. AFV Credits and Emissions Trading -- AFV credits and emissions trading promote cost-effective compliance with EPAct and Clean Air Act requirements. Market-based incentives are a means to achieve compliance at the lowest possible net cost.

VII. Recommendations

The State of Michigan's Alternative Fueled Vehicle Inter-Departmental Task Force recommends:

Fuel Neutrality

1. The State's long-term policy goals should be neutral to all vehicle fuels, both conventional and alternative fuels. Since each type of vehicle fuel has advantages and disadvantages and will be the best fuel for certain applications, the marketplace should determine which fuels are selected.

2. Legislation should be enacted to address the existing disparities in motor fuel taxes. Since some alternative fuels are not liquid fuels and existing fuel taxes were designed for liquid fuels, increased use of alternative fuels will necessitate a reexamination of how road users are taxed.

3. State tax policies that effect the cost of vehicle fuels, both conventional and alternative fuels, should be examined to determine if the policies are consistent with the long term policy goal of fuel neutrality.

Market Barriers

4. The short-term policy of the State should be to reduce market barriers to the introduction of alternative fuels and increase competition between all vehicle fuels.

5. The AFV Task Force has examined a number of issues related to AFV's and has tried to identify market barriers to the introduction of AFV's. For example, the treatment of alternative fuel sales should be changed to assure accuracy and truthfulness in regulating the commercial quality standards and quantity of alternative fuels. It should be a continuing responsibility of the Task Force to assure that state government does not inadvertently create regulatory or other market barriers that inhibit the growth of the alternative fuels industry.

6. The lack of information about AFV options is a significant barrier to a greater use of alternative fuels. The State of Michigan should seek funds for a public education program that will help the public and fleet managers make informed decisions about AFV's, assist AFV drivers to locate fueling sites that have alternative fuels, and train emergency responders on how to identify and address situations involving alternative fuels.

7. The lack of a retail fueling infrastructure to support AFV's is a critical market barrier. The State of Michigan should continue to support the development of a retail fueling infrastructure for AFV's and State AFV's should use retail fueling whenever feasible.

8. The Clean Cities Program should be used to provide community-wide planning to develop AFV infrastructure. The State of Michigan should work with municipalities to develop Clean Cities Plans and encourage the broad participation of the utilities, fuel providers, and public and private fleets.

9. Temporary financial incentives for both the public and private sectors can help push the marketplace to develop an alternative fueling infrastructure and offer a greater variety of AFV's for sale. Modest state financial incentives can potentially be justified by the energy security, risk reduction, trade balance, economic development, and environmental benefits that are possible from a greater use of AFV's. Various incentive approaches should be considered including incentives for alternative fueled vehicle purchases, retail fueling infrastructure and in-state production of alternative fuels. Should one or more incentive approach appear warranted, it should be justified by an analysis of estimated benefits and costs. Incentives should be temporary and discontinued after AFV's comprise a significant portion of the motor vehicle population.

VIII. Minority Report

The Department of Treasury has been an active member of the Alternative Fueled Vehicle Inter-departmental Task Force and has worked alongside representatives of other state agencies to examine issues relating to alternative fueled vehicles (AFV's). The Task Force has studied the use of AFV's and their place in the market for vehicles and transportation services.

While the Department of Treasury agrees with much of the draft version of the "Michigan State Plan for Alternative Fueled Vehicles," there are significant points on which we disagree with the general opinion of the rest of the group. As such, we submit our differing opinions and our reasons for dissent.

Section IV - Potential Benefits of AFV's

In Section IV of the draft plan, the task force identifies three potential benefits that would arise with an increased use of AFV's.

1. Investing in alternative fueled vehicles is an insurance policy against the risk of the unavailability of foreign oil. Some consumers will choose to insure themselves from risk, weighing the price of insurance against the potential costs. State government need not intervene in that market decision.

2. Stimulating markets for AFV's will help markets for AFV's, alternative fuels, and the infrastructure (such as fueling stations) grow, yielding jobs and investment. Again, the state should not intervene in efficiently operating private markets which provide a socially optimal allocation of capital and labor.

3. Health benefits have not been measured and weighed against the cost of providing incentives. Absent empirical evidence, the theoretical benefits of reduced pollution do not justify incentives.

Section VI - Findings

Item 1. EPAct. *The report argues a greater availability of vehicles and fueling sites would be a benefit because state government is required to purchase AFV's.* Arguing that public funds would be saved (savings to the state's fleet) by spending public funds (establishing incentives) is questionable logic. The benefits enjoyed by the state's motor fleet would be illusory as they would be counterbalanced by the cost of providing the incentives.

Item 3. Potential Benefits of AFV's. *The report claims "...greater use of AFV's would contribute to significant... benefits for Michigan" (emphasis added).* We do not believe such an assertion is warranted without further study and review of pertinent literature.

Section VII - Recommendations

We agree with **Recommendation 1**: offering financial incentives for AFV's will distort an otherwise efficiently operating market. The state should encourage fuel neutrality. Market forces will determine which fuel is best for each application.

We also agree with the concept embodied in **Recommendation 2**. The current tax treatment of fuels

does result in some *de facto* incentives to consume certain types of fuels. Some of these incentives are the result of conscious policy choices, others are artifacts of a statute not yet updated to reflect changes in technology. Users of the state's roadways should pay fuel tax proportionate to their use of the roads, regardless of the type of fuel consumed.

The motor fuel tax is not the only tax affecting the viability of different types of fuels. Tax burdens can potentially differ for producers of alternative versus conventional fuels, manufacturers of vehicles propelled by alternative fuels, and those who provide the infrastructure necessary to fuel vehicles. We agree with **Recommendation 3**: other sources of differential treatment between fuels should be examined for their "fuel neutrality."

Recommendations 4 through 9 pertain to market barriers to the introduction of alternative fuels. According to economic theory, government intervention in private markets is warranted when there are conditions restricting the ability of persons or firms to enter the market. The lack of a fueling infrastructure, mentioned in Recommendations 7 and 8, is not a barrier to entry into the market for alternative fuels. Economic conditions do not make it financially viable to enter the market. Manufacturers of alternative fueled vehicles may price their cars to encourage sales. Those sales could produce a demand for alternative fuels sufficient to support a fueling infrastructure. Indeed, the task force report states on page 25, "Nothing precludes a utility from privately investing in retail alternative fuel stations." Manufacturers and utilities do not because it is not economically feasible to do so. The inability to enter a market justifies government intervention in the market. The lack of financial incentive does not.

Recommendation 9 argues that "modest" and "temporary" financial incentives can assist the market in developing AFV's and can potentially be justified by the benefits they would produce.

1. We question the need for incentives to produce the desired benefits. The market mechanism will produce benefits if they exceed the cost of producing them. We find it difficult to justify the expenditure of tax dollars to bring about benefits that A) an undisturbed market would produce anyway, or B) would not be produced by the market because the cost of producing them exceeded the benefits themselves.

2. We do not believe the benefits would withstand the scrutiny of a valid benefit-cost analysis: tax expenditures and distorting markets would not exceed the benefits of increased use of AFV's.

3. The report recommends a "level playing field" for different fuels (Recommendation 1), yet claims that unequal treatment for producers, infrastructure, and vehicles can be justified. Either the market will determine which vehicles and fuels are purchased, or it will not. If any incentives are warranted, we believe the most efficient way to encourage the use of AFV's is by providing incentives to purchase motor fuel rather than incentives for the production of fuel, infrastructure, or vehicles.

4. Few tax incentives are truly "temporary." The state should carefully consider enacting another exemption in the tax code which will be routinely extended or eliminated at a later date.

References

Energy Information Administration, *Alternatives to Traditional Transportation Fuels 1994*, Volumne 1, February 1996, Washington, D.C.

Federal Register, Vol. 60, No. 39, Tuesday, February 28, 1995, *Proposed Rules for Alternative Fuel Transportation Program.*

Ferris, John N. 1995, *Evaluation of the Economic Impact of a Dry Mill Ethanol Plant in Michigan Using Corn as a Feedstock,* Michigan State University, Department of Agricultural Economics Staff Paper 95-60.

Longcore, Kathleen 1995, *Farmers Hail New Soybean Operation,* Grand Rapids Press, A-1, August 15.

Michigan's Environment and Relative Risk, Funded by the U.S. Environmental Protection Agency and administered by the Michigan Department of Natural Resources, July 1992.

Shapouri, Hosein, James A. Duffield, and Michael S. Grabaski 1995, *Estimating the Net Energy Balance of Corn Ethanol*, U.S. Department of Agriculture, Agricultural Economics Report No. 721, July 1995.

Wang, Michael Quanlu 1993, *Cost-Effectiveness of Controlling Emissions for Various Alternative Fuel Vehicle Types, with Vehicle and Fuel Price Subsidies Estimated on the Basis of Monetary Values of Emission Reductions,* prepared for the Conference on Transportation and Energy Strategies for a Sustainable Transportation System, Asilomar Conference Center, Pacific Grove, California, August 22-25.

Wolfson, David 1996, *The 50 Million Gallon Ethanol Plant,* Michigan Department of Agriculture Memorandum, January 23.

Wolfson, David 1996, *Background on Soydiesel*, Michigan Department of Agriculture Memorandum, February 2.

Appendix A

Members of the Alternative Fueled Vehicle Inter-Departmental Task Force

John Sarver	Task Force Chair, Department of Consumer and Industry Services
Duane Berger	Motor Transport, Department of Management and Budget
Dan Blair	Electric Division, Michigan Public Service Commission
Bill Clifford	Fire Marshal, Department of State Police
Mike Collins	Gas Division, Michigan Public Service Commission
Bob Craig	Policy, Department of Agriculture
Matt Hanley	Office of Legislation, Department of Treasury
Jerome Jonson	Urban & Public Transportation, Department of Transportation
Steve Madejek	Branch Office Services, Secretary of State
Tom Martin	Policy, Department of Consumer and Industry Services
Ronald Overton	Motor Transport, Department of Management and Budget
Jan Patrick	Energy Resources, Department of Consumer and Industry Services
Ronan Patterson	Policy, Michigan Public Service Commission
Jeffrey Pillon	Technical Services, Michigan Public Service Commission
Peter Porciello	Planning, Department of Transportation
Bob Rusch	Air Quality, Department of Environmental Quality
Marsha Small	Planning, Department of Transportation

Appendix B: Energy Policy Act (EPAct) of 1992
AFV Provisions

On October 8, 1992, Congress gave final approval to the "Energy Policy Act of 1992," culminating more than two years of debate, much of which was generated by President Bush's original National Energy Strategy proposed in February of 1991. The Act, which was signed into law as PL 102-486 by President Bush on October 24, 1992, provides a major change to the way energy is produced and consumed, regulated and taxed in the United States.

The expansive document (over 1,000 pages) is the most comprehensive energy policy legislation enacted by Congress in more than a decade. The Act offers specific provisions and programs to improve the energy efficiency of buildings, equipment and industrial processes; promotes the use of alternatives to gasoline in state, federal, municipal and large private vehicle fleets; fosters competition through regulatory reform in the electric utility industry; encourages the development of renewable energy resources; and streamlines the licensing process for nuclear power plants while paving the way for individual states to regulate low-level radioactive waste. This paper examines the specific provisions on alternative fueled vehicles.

SUMMARY - Titles III, IV, V, VI on Alternative Fueled Vehicles

These four titles all envision a shift away from reliance upon gasoline fueled vehicles to alternative fuels, such as methanol, ethanol, natural gas and electricity. The Law requires that vehicle fleet operators begin moving toward alternatively fueled vehicles, by mandating that a certain percentage of new fleet purchases be alternatively fueled. New state government vehicle purchases, for instance, must be 10% alternative fuel vehicles beginning in 1996 rising to 75% by the 2000. Federal fleets must move more rapidly, while private and local government fleets have a more extended timetable.

In recognition of the fact that the infrastructure is not yet in place for refueling alternative fuel vehicles, the Act also provides certain incentives. For instance, state and federal regulatory authority over sales of natural gas for vehicular purposes is limited (the Michigan Public Service Commission [MPSC] has already issued a declaratory ruling that such sales are not subject to MPSC jurisdiction), and substantial federal tax breaks are included for development of fueling sites.

Purchases of alternative fueled vehicles are also subject to fairly significant federal tax breaks, up to as much as $2,000 per clean-fuel vehicle, $4,000 for electric vehicles, and up to $50,000 for trucks or buses.

Implementing many of the alternative fuel programs could be expensive, and the act includes substantial grants and low-interest loans to assist in the effort.

TITLE III Alternative Fuels - General

Section 301(2) - defines alternative fuels as:

methanol, denatured ethanol, and other alcohols; mixtures containing 85 percent or more by volume of methanol*, denatured ethanol, and other alcohols with gasoline or other fuels; natural gas; liquefied petroleum gas (LPG);

hydrogen; coal-derived liquid fuels; fuels derived from biological materials; electricity (including electricity from solar energy); and any other fuel the Secretary determines, by rule, is substantially not petroleum and would yield substantial energy security benefits and substantial environmental benefits.

> * or such other percentage, but not less than 70%, as determined by the Secretary, by rule, to provide for requirements relating to cold start, safety, or vehicle functions.

Section 301(9) - defines the term fleet to mean:

> a group of 20 or more light duty vehicles (under 8,500 pounds) used primarily in Metropolitan Statistical Areas (MSA) over 250,000 (1980 Census), and that are or could be centrally fueled. Several groups of vehicles are also excluded including law enforcement, emergency vehicles, certain military vehicles, non-road vehicles and others.

In Michigan, these requirements will affect fleet operators in the counties which comprise the following Metropolitan Statistical Areas (MSA): Detroit-Ann Arbor-Flint (Genesee, Lapeer, Lenawee, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, Wayne), Lansing-E. Lansing (Clinton, Eaton, Ingham), Bay- Saginaw-Midland (Bay, Saginaw, Midland), Grand Rapids- Muskegon-Holland (Allegan, Kent, Muskegon, Ottawa) and Kalamazoo-Battle Creek (Calhoun, Kalamazoo, Van Buren).

Federal Vehicle Fleets

Section 303 - requires the federal government to purchases light duty alternative fueled vehicles (AFVs) in the following amounts:

1) 5,000 in FY '93,
2) 7,500 in FY '94,
3) 10,000 in FY '95;

Federal fleet percentages of AFVs then go into effect as follows:

1) 25% in FY '96,
2) 33% in FY '97,
3) 50% in FY '98,
4) 75% in FY '99 and thereafter.

Section 304 - encourages fueling at commercial facilities unless such commercial facilities are not available.

Federal operations in Michigan that will be affected include federal agencies, courts, and the U.S. Postal Service located in MSA's covered by the Act in Section 301(a).

TITLE IV Alternative Fuels Non-Federal

Section 404 - limits state public utility commission authority over natural gas sales for transportation purposes. This Section does not affect Michigan since the Michigan Public Service Commission has already made a similar determination. On March 13, 1992, the Commission issued a declaratory ruling stating that the distribution and sale of natural gas as a motor vehicle fuel, as proposed by Amoco, is not subject to the regulation of the Michigan Public Service Commission.

Section 406 - requires the FTC to establish labeling requirements for AFV's and the FTC is to seek the views of state agencies in implementing this requirement.

Section 407 - requires DOE's Energy Information Administration to collect data on AFV use, including cooperation with states.

State and Local Incentive Program

Section 409 - establishes a state and local AFV incentive program to promote use of these vehicles. Guidelines must be issued by the Secretary of Energy within one year, and the Governors are "invited" to submit plans within two years. In addition to technical assistance and funding (with a 20 percent match), there is a specific requirement for coordinating vehicle purchases with GSA. (See Section 409(b)(3).) Spending authorization of $10 million annually for five years is included to support this provision.

Each proposed State plan, in order to eligible for Federal assistance under this section, shall describe the manner in which coordination shall be achieved with Federal and local governmental entities in implementing such plan, and shall include an examination of:

(A) exemption from state sales tax or other state or local taxes or surcharges (other than such taxes or surcharges which are dedicated for transportation purposes) with respect to alternative fueled vehicles, alternative fuels, or alternative fueling facilities;

(B) the introduction of alternative fueled vehicles into state-owned or operated motor vehicle fleets;

(C) special parking at public buildings and airports and transportation facilities;

(D) programs of public education to promote the use of alternative fueled vehicles;

(E) the treatment of sales of alternative fuels for use in alternative fueled vehicles;

(F) methods by which state and local governments might facilitate:

- (i) the availability of alternative fuels; and
- (ii) the ability to recharge electric motor vehicles at public locations;

(G) allowing public utilities to include in rates the incremental cost of:

(i) new alternative fueled vehicles;
(ii) converting conventional vehicles to operate on alternative fuels; and
(iii) installing alternative fuel fueling facilities, but only to the extent that the inclusion of such costs in rates would not create competitive disadvantages for other market participants, and taking into consideration the effect inclusion of such costs would have on rate, service, and reliability to other utility customers;

(H) such other programs and incentives as the state may describe;

(I) whether accomplishing any of the goals in this subsection would require amendment to state law or regulation, including traffic safety prohibitions;

(J) services provided by municipal, county, and regional transit authorities; and

(K) effects of such plan on programs authorized by the Intermodal Surface Transportation Efficiency Act of 1991 and amendments made by that Act.

Section 410 - establishes "cooperative agreements" or joint venture programs under the U.S. Department of Transportation (DOT) with local and regional governments to promote bus purchases in urban areas with population greater than 100,000. This program has a 20 percent local match requirement. Section 410 also establishes a separate school bus program operated by DOT, which promotes vehicle purchases by assisting financially local governments or contractors for local governments. Section 410 is authorized at $30 million annually for FY '93-95.

Section 414 - establishes a federal low-interest loan program for private fleet conversions covering the incremental costs of the vehicles. The program is authorized at $25 million annually for FY '93-95.

TITLE V Availability and Use of Replacement Fuels, Alternative Fuels, and Alternative Fueled Vehicles

Title V covers private, municipal and state government vehicle fleets. As with the federal vehicle fleet these provisions only apply to fleets used primarily in MSAs larger than 250,000 in population

Private Vehicle Fleets

Section 501 - sets forth the AFV purchase mandates for "covered persons" as follows:

1) 30% for model year 1996;
2) 50% for model year 1997;
3) 70% for model year 1998;
4) 90% for model year 1999 and thereafter.

"Covered persons" include alternative fuel providers, processors, transporters; private and publicly-owned utilities (other than federal power marketing administrations), and certain types of oil producers over 50,000 barrels/day, if they also are involved in alternative fuels production in a "substantial" manner. The provision permits exemptions to be granted by the Secretary if either the fuels or the AFVs are not "reasonably available"; delays are also permitted by the Secretary.

Section 507 - establishes a private and municipal vehicle fleet program requiring AFV to comprise the following percentages:

1) 20% from 1999-2001;
2) 30% in 2002;
3) 40% in 2003;
4) 50% in 2004;
5) 60% in 2005;
6) 70% in 2006 and thereafter.

There are numerous loopholes which allow extension of the program even beyond these dates. Under the Act, the Secretary of Energy has the authority early on, to postpone the start of the phase-in to 2002 and could delay it further if the auto industry does not supply enough AFV or if fueling facilities are insufficient or cost unreasonable as compared to conversion fuels.

State Vehicle Fleets

Section 507 - mandates the following state vehicle purchases of AFVs:

1) 10% in model year 1996;
2) 15% in model year 1997;
3) 25% in model year 1998;
4) 50% in model year 1999;
5) 75% in model year 2000 and thereafter.

The provisions require drafting of a federal rule for State Plan submittal within 18 months and State Plan submittal within 30 months of national Energy Policy Act enactment. The State Plan can provide for "voluntary" private conversions to offset state fleet mandates. Over-compliance would create a credit system which could be transferred, under Section 508, for any fleets covered under the Act.

Related Provisions in Other Titles and Statues

Title XIX Energy Revenue Provisions of the National Energy Policy Act provides for a tax deduction for the incremental cost of a clean-fuel vehicles, but not more than $2,000 per vehicle. (See Section 1913.) This provision also permits deductions for $5,000 - $50,000 for certain types of clean fuel trucks or buses. The deduction begins to phase out in 2002 reaching a level of 25 percent in 2004. The qualifying vehicles include those run on natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, electricity and other fuels at least 85 percent of which is ethanol, methanol, or other alcohols. In addition, Title XIX provides a deduction of up to $100,000 per location for refueling property, and a 10 percent credit (up to

$4,000 per vehicle) for electric vehicles. (The electric vehicle credit phases out beginning in 2002).

TITLE VI Electric Motor Vehicles

Subtitle A - Electric Motor Vehicle Commercial Demonstration

The sections of this subtitle address the establishment of programs for electric motor vehicle (EV) commercial demonstration. specifically, Subtitle S provides $50 million over a 10-year period (beginning in FY '94) for an EV demonstration program. The program requires a 50 percent match.

Subtitle B - Electric Motor Vehicle Infrastructure and Support systems Development Program.

This program provides financial assistance to non-federal entities for costs shared in research, development, and demonstration of stations to service EVs, among other things.

Section 622 - Proposals - Requires DOE to solicit proposals for projects to develop infrastructure and support for electric vehicles. DOE will fund ten projects with $4 million per project.

Section 625 - Electric Utility Participation Study - Requires DOE to conduct a study, in consultation with State commissions into "the means by which electric utilities may invest in, own, sell, lease, service, or recharge batteries used to power electric motor vehicles."

Other Related Titles

Title XX General Provisions: Reduction of Oil Vulnerability, Subtitle B provides for research and development of alternative transportation fuels technology. The Subsection covers research on advanced fuel economy, alternative fuel vehicle technology, electric motor vehicles and associated equipment, the use of hydrogen, advanced diesel emissions program and a telecommuting study. This Subsection authorizes $485.3 million to support this R & D effort between fiscal years 1993 and 1998.